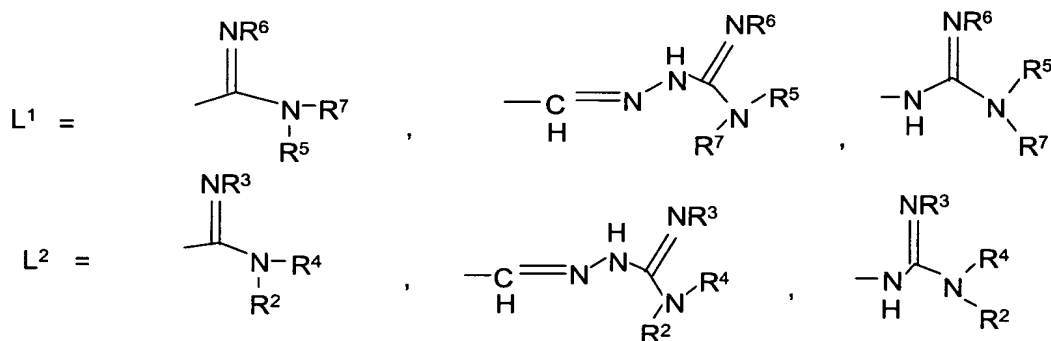
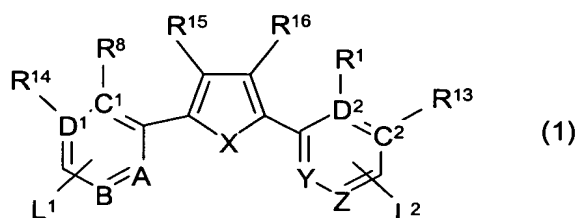


# CLAIMS

What is claimed is:

1. A compound of Formula (I):



5

wherein:

X is selected from the group consisting of O, S, and  $NR^{17}$ , where  $R^{17}$  is hydrogen or lower alkyl;

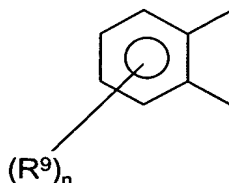
10  $C^1$ ,  $C^2$ , A, and Y are CH, N,  $NR^{17}$ , O, or S, wherein  $C^1$  and  $C^2$  are the same or different;

$D^1$ ,  $D^2$ , B, and Z are CH, N, or  $NR^{17}$  wherein  $D^1$  and  $D^2$  are the same or different; provided that B, Z, or both B and Z are not present when A, Y, or both A and Y are O, S, or  $NR^{17}$ ;

15  $R^{13}$ ,  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^1$  and  $R^8$  are selected from the group consisting of H, lower alkyl, halogen, alkoxyl, aryloxy, aralkoxy and hydroxyl;

$R^3$  and  $R^6$  are each independently selected from the group consisting of H, hydroxy, lower alkyl, cycloalkyl, aryl, aralkyl, alkoxyl, hydroxycycloalkyl, alkoxycycloalkyl, hydroxyalkyl, aminoalkyl, acyloxy, acetoxy, and alkylaminoalkyl;

and  $R^2$ ,  $R^4$ ,  $R^5$  and  $R^7$  are each independently selected from the group consisting of H, lower alkyl, alkoxyalkyl, cycloalkyl, aryl, aralkyl, hydroxyalkyl, aminoalkyl, and alkylaminoalkyl, or  $R^2$  and  $R^4$  together or  $R^5$  and  $R^7$  together represent a  $C_2$  to  $C_{10}$  alkyl, hydroxyalkyl, or alkylene, or  $R^3$  and  $R^4$  together or  $R^6$  and  $R^7$  together are:



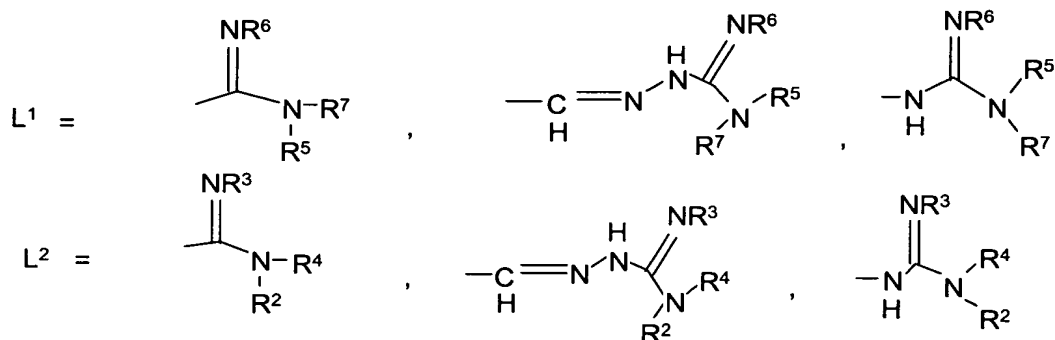
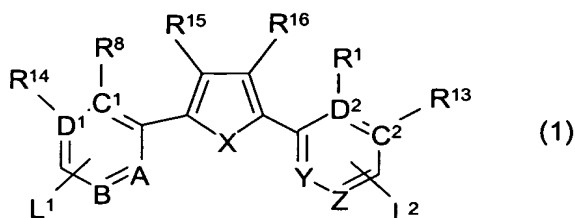
wherein  $n$  is a number from 1 to 3, and  $R^9$  is H or  $-\text{CONHR}^{10}\text{NR}^{11}\text{R}^{12}$ , wherein  $R^{10}$  is lower alkyl and  $R^{11}$  and  $R^{12}$  are each independently selected from the group consisting of H and lower alkyl.

2. The compound of claim 1, wherein A and B are different and N or CH; Y and Z are CH; X is O or S;  $R^2$ ,  $R^4$ ,  $R^5$ , and  $R^7$  are each H; and  $R^1$ ,  $R^3$ ,  $R^6$  and  $R^8$  are selected from the group consisting of H, OH, methyl, methoxy, and acetoxy.

3. The compound of claim 1, wherein A and B are CH; X is O; Y is O;  $R^2$ ,  $R^4$ ,  $R^5$ , and  $R^7$  are each H; and  $R^1$ ,  $R^3$ ,  $R^6$  and  $R^8$  are selected from the group consisting of H, OH, methyl, methoxy, and acetoxy.

4. The compound of claim 1, further comprising a pharmaceutically acceptable carrier.

5. A method of treating microbial infection in a subject in need thereof, the method comprising administering to the subject an effective amount of a compound of Formula (I):



wherein:

X is selected from the group consisting of O, S, and  $NR^{17}$ , where  $R^{17}$  is hydrogen or lower alkyl;

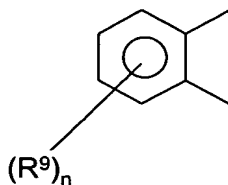
$C^1$ ,  $C^2$ , A, and Y are CH, N,  $NR^{17}$ , O, or S, wherein  $C^1$  and  $C^2$  are the same or different;

$D^1$ ,  $D^2$ , B, and Z are CH, N, or  $NR^{17}$  wherein  $D^1$  and  $D^2$  are the same or different; provided that B, Z, or both B and Z are not present when A, Y, or both A and Y are O, S, or  $NR^{17}$ ;

$R^{13}$ ,  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^1$  and  $R^8$  are selected from the group consisting of H, lower alkyl, halogen, alkoxyl, aryloxy, aralkoxy and hydroxyl;

$R^3$  and  $R^6$  are each independently selected from the group consisting of H, hydroxy, lower alkyl, cycloalkyl, aryl, aralkyl, alkoxyl, hydroxycycloalkyl, alkoxycycloalkyl, hydroxyalkyl, aminoalkyl, acyloxy, acetoxy, and alkylaminoalkyl; and  $R^2$ ,  $R^4$ ,  $R^5$  and  $R^7$  are each independently selected from the group consisting of H, lower alkyl, alkoxyalkyl, cycloalkyl, aryl, aralkyl, hydroxyalkyl, aminoalkyl, and alkylaminoalkyl, or  $R^2$  and  $R^4$  together or  $R^5$  and  $R^7$  together represent a  $C_2$  to  $C_{10}$  alkyl, hydroxyalkyl, or alkylene, or  $R^3$  and  $R^4$  together or  $R^6$

and R<sup>7</sup> together are:



5 wherein n is a number from 1 to 3, and R<sup>9</sup> is H or –CONHR<sup>10</sup>NR<sup>11</sup>R<sup>12</sup>, wherein R<sup>10</sup> is lower alkyl and R<sup>11</sup> and R<sup>12</sup> are each independently selected from the group consisting of H and lower alkyl.

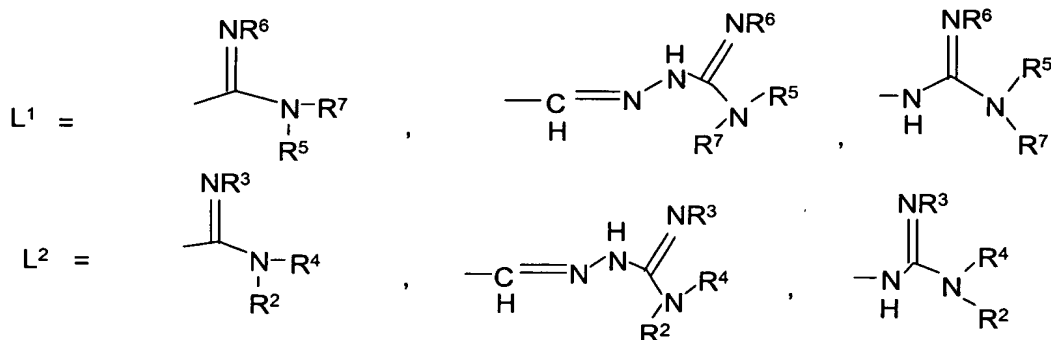
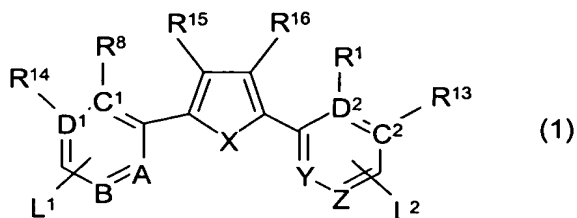
6. The method of claim 5, wherein A and B are different and N or CH; Y and Z are CH; X is O or S; R<sup>2</sup>, R<sup>4</sup>, R<sup>5</sup>, and R<sup>7</sup> are each H; and R<sup>1</sup>, R<sup>3</sup>, R<sup>6</sup>, and R<sup>8</sup> are selected from the group consisting of H, OH, methyl, methoxy, and  
10 acetoxy.

7. The method of claim 5, wherein A and B are CH; X is O; Y is O; R<sup>2</sup>, R<sup>4</sup>, R<sup>5</sup>, and R<sup>7</sup> are each H; and R<sup>1</sup>, R<sup>3</sup>, R<sup>6</sup>, and R<sup>8</sup> are selected from the group consisting of H, OH, methyl, methoxy, and acetoxy.

8. The method of claim 5, wherein the microbial infection is a  
15 *Trypanosoma brucei rhodesiense* infection or a *Plasmodium falciparum* infection.

9. A pharmaceutical formulation comprising:

(a) a compound of Formula (I):



wherein:

5 X is selected from the group consisting of O, S, and  $NR^{17}$ , where  $R^{17}$  is hydrogen or lower alkyl;

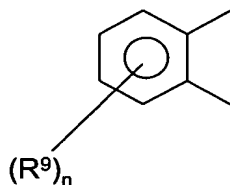
$C^1$ ,  $C^2$ , A, and Y are CH, N,  $NR^{17}$ , O, or S, wherein  $C^1$  and  $C^2$  are the same or different;

10  $D^1$ ,  $D^2$ , B, and Z are CH, N, or  $NR^{17}$  wherein  $D^1$  and  $D^2$  are the same or different; provided that B, Z, or both B and Z are not present when A, Y, or both A and Y are O, S, or  $NR^{17}$ ;

$R^{13}$ ,  $R^{14}$ ,  $R^{15}$ ,  $R^{16}$ ,  $R^1$  and  $R^8$  are selected from the group consisting of H, lower alkyl, halogen, alkoxyl, aryloxy, aralkoxy and hydroxyl;

15  $R^3$  and  $R^6$  are each independently selected from the group consisting of H, hydroxy, lower alkyl, cycloalkyl, aryl, aralkyl, alkoxyl, hydroxycycloalkyl, alkoxycycloalkyl, hydroxyalkyl, aminoalkyl, acyloxy, acetoxy, and alkylaminoalkyl; and  $R^2$ ,  $R^4$ ,  $R^5$  and  $R^7$  are each independently selected from the group consisting of H, lower alkyl, alkoxyalkyl, cycloalkyl, aryl, aralkyl, hydroxyalkyl, aminoalkyl, and alkylaminoalkyl, or  $R^2$  and  $R^4$  together or  $R^5$  and  $R^7$  together represent a  $C_2$  to  $C_{10}$  alkyl, hydroxyalkyl, or alkylene, or  $R^3$  and  $R^4$  together or  $R^6$

and R<sup>7</sup> together are:



5 wherein n is a number from 1 to 3, and R<sup>9</sup> is H or -CONHR<sup>10</sup>NR<sup>11</sup>R<sup>12</sup>, wherein R<sup>10</sup> is lower alkyl and R<sup>11</sup> and R<sup>12</sup> are each independently selected from the group consisting of H and lower alkyl; and

(b) a pharmaceutically acceptable carrier.

10 10. The pharmaceutical formulation of claim 9, wherein A and B are different and N or CH; Y and Z are CH; X is O or S; R<sup>2</sup>, R<sup>4</sup>, R<sup>5</sup>, and R<sup>7</sup> are each H; and R<sup>1</sup>, R<sup>3</sup>, R<sup>6</sup>, and R<sup>8</sup> are selected from the group consisting of H, OH, methyl, methoxy, and acetoxy.

15 11. The pharmaceutical formulation of claim 9, wherein A and B are CH; X is O; Y is O; R<sup>2</sup>, R<sup>4</sup>, R<sup>5</sup>, and R<sup>7</sup> are each H; and R<sup>1</sup>, R<sup>3</sup>, R<sup>6</sup>, and R<sup>8</sup> are selected from the group consisting of H, OH, methyl, methoxy, and acetoxy.